
A Simplified Activity-Based Costing Approach for SMEs: The Case Study of an Italian Small Road Company

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Abstract:

Purpose: The paper proposes an original conceptual model for designing a simplified Activity-Based Costing (ABC) approach for Small and Medium-sized Enterprises (SMEs) by focusing on the transport sector.

Design/Methodology/Approach: The model is designed starting from the distinctive characteristics of the SMEs' collaborative culture. The approach is then tested in the case of an Italian small-road company.

Findings: The simplified ABC, which was gradually introduced in the SME, allowed the firm to gain confidence with the costing system. Moreover, the discussion of the results led to identifying the main areas to improve.

Practical Implications: Costing systems based on collaboration can lead to operational improvements in SMEs operating in dynamic and competitive sectors as transport. Moreover, advanced technologies may hold a crucial role for their development.

Originality/Value: Not much research has considered collaboration as a driver for introducing ABC in SMEs. The paper contributes to the literature on simplified managerial approaches, suggesting trends for future research.

Keywords: Activity-based costing, collaboration, SMEs, transportation.

JEL Codes: M41, L25, L91.

Paper type : Research article.

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1. Introduction

Companies in the transport sector struggle to determine their logistics costs, often hidden in overheads, putting at stake their visibility and control (Pohlen and La Londe, 1994). However, the European transport sector is called to provide the best products and services, in time and cost-efficiency. The role of Small and Medium-sized Enterprises (SMEs) in meeting these challenges is critical being key players in supply chains (EC, 2017). The adoption of advanced costing systems, as Activity Based Costing (ABC), can help to identify the real costs of operations and services (Baykasog and Kaplanog, 2008). Moreover, since in a transport company the cost structure is multidimensional, ABC offers a more analytical and accurate perspective (Kock and Weber, 2008).

However, the complexity behind ABC has caused its low adoption, especially among SMEs (Needy *et al.*, 2003) constrained in financial and human capital (Hicks, 1999). Even if, as underlined by Loth (2012), managerial accounting systems, as ABC, can be equally beneficial for SMEs as for large corporations when the benefits do not outweigh the associated costs. Nevertheless, SMEs' distinctive features and differences in respect to large firms, make the adoption of the "classical" version of ABC an excessive "organizational effort" risking not considering the benefits that can be achieved (Machado, 2012). Therefore, it is necessary to find methodologies able to select data to implement such costing systems, balancing the simplicity required while adjusting to the features of SMEs (Kocakulah *et al.*, 2017).

Not much research focusing on simplified versions of ABC has considered exploiting dimensions linked to a collaborative culture. The paper aims to cover this gap suggesting new trends for future research. As recognized by Askarany *et al.* (2010), smaller firms need more attention than large firms, regardless of the industry, in ABC adoption and cost and information analysis for SMEs cannot be ignored (Grima *et al.*, 2019). The research proposes a model for a simplified ABC approach in an Italian Small Road company combining in an innovative way the framework of Bharara and Lee (1996) and the model of Roztocki *et al.* (2004) to gradually introduce the costing system, making the SME aware of the achievable benefits while exploiting the informal conditions of its collaborative culture. The paper is structured as follows. Firstly, ABC is described considering its implementation in SMEs with a focus on the transport sector. After explaining the methodology, the case study is illustrated discussing the main results. Finally, conclusions and further research suggestions are drawn.

2. Literature Review

Activity-Based Costing (ABC) was introduced at the end of the 1980s as a source of more reliable cost information for products, customers, services and processes overcoming the limits of traditional systems (Berliner and Brimson, 1988). ABC by being centred on activities and on their absorption from different cost objects,

allowed to highlight the risky cross-subsidy phenomenon caused by traditional full costing. The identification of resource and activity drivers, as the way in which activities are linked through the firm's processes according to value generation, determines where to conduct profitable actions (Cokins, 2001). ABC has interested different sectors, as the finance (Vieira and Hoskin, 2005), health (Cinquini *et al.*, 2009) and hospitality (Raab and Maye, 2009). ABC adoption has considered also the logistic and transport sector (Themido *et al.*, 2000) where it becomes essential to know the real cost drivers of services and the cost of activities contributing to production to assess profitability and operation efficiency (Hofmann and Bosshars, 2017). In transport services, ABC approaches are investigated both in private sector from road (Baykasog and Kaplanog, 2008) and forests transport (Nurminen *et al.*, 2009) to public mass transport (Popesko *et al.*, 2016) in rail transportation (Watanapa *et al.*, 2016) and airline industry (Koch and Weber, 2008).

Since the costs structure of a transport company is multidimensional, ABC provides a more analytical perspective (Popesko and Novák, 2011), considering factors, as kind of transport means, locations, and conditions, whose detailed analysis leads to be more strategic for the competitiveness of the sector (Kock and Weber, 2008). Besides these advantages, studies highlighted how compared to manufacturing and other service sectors, the adoption of ABC in transport companies is characterized by greater complexity in measuring outputs, defining activities and specific cost drivers. Activities may be less predictable respect to the services requested and joint capacity represents a high portion of total costs, thus it becomes difficult to link these to activities (Rotch, 1990). The complexity of business processes can increase the load of ABC calculations (Baykasog and Kaplanog, 2006). Consequently, for transport companies, it is difficult determining logistics costs since these are often enclosed in the "hidden factory" (Miller and Volman, 1985) and in transactions causing overhead expenses. This means that managers do not have adequate visibility and control over indirect costs (Pohlen and La Londe, 1994).

In addition to these difficulties, it is necessary to add variables that may challenge ABC implementation related to contextual factors, such as strategy, organizational structure, competition, environmental uncertainty and product diversity (Gosselin, 1997; Al-Omiri, 2011). Among these, company size becomes relevant for ABC adoption (Ahmadzadeh *et al.*, 2011), which is more expensive and labor-consuming to implement and maintain, respect to traditional systems, in an operational context which is "less complex" as that of SMEs. Moreover, in SMEs, training and software requirements may even prohibit its adoption (Özyürek and Yılmaz, 2016) and managers could be let down by time and effort to develop ABC (Needy *et al.*, 2003). SMEs' operative aspects represent a barrier for ABC diffusion in their management control processes, perceived excessive in a cost-benefit analysis (Cooper and Kaplan, 1998). However, SMEs face a modern global context in a hypercompetitive environment where process innovation management and the evaluation of its efficiency and time are key competitive advantages (Havlíček *et al.*, 2013), especially in dealing with the introduction of the new technologies in the transport

sector (Harris *et al.*, 2015). SMEs struggle with the same managerial difficulties as large enterprises and need to straighten their organizational capacity in dealing with turbulent environments (Taekyung and Dongwoo, 2015). Thus, their management accounting and costing systems are crucial in supporting decision-making and business functions (Ahmad, 2017).

SMEs need access to the same informative advantages offered by ABC, especially, those operating in the transport sector dealing with a dynamic competitive context at the same extend as big companies (EPRS, 2016). These requirements come from a sector that in Europe is characterized by large enterprises involved in postal services, air, and rail transport with a relevant number of small players (Eurostat, 2017). These considerations cannot be overlooked by the costing literature. We believe that ABC can offer solutions that, starting from a greater understanding of the limits of adopting advanced system, can help overcome them through a “simplified” and gradual approach tailored for a less complex context.

2.1 Suggesting a Gradual and Simplified ABC Model for SMEs

Small and medium-sized companies are often restrained in their ability to exercise managerial accounting because they lack the necessary resources. Managerial accounting can be beneficial to these firms as it is for large corporations when the benefits of managerial accounting do not outweigh the associated costs (Lohr, 2012). Nevertheless, ABC literature has mainly focused on large firms, both in transport sector than in others (Gosselin, 2007; Schoute, 2004), while studies in SMEs resulted slower (Foroughi *et al.*, 2017). These studies outlined ABC benefits in SMEs proving the usefulness of the system as advantages for profitability and growth (Rios-Marinquez *et al.*, 2014). Even in businesses producing low volumes of products/services the risk of distortions in the true product/services costs, generated by traditional costing systems occurs. ABC can provide accurate measures of activity costs whose intensity is not proportional to the volume of output produced (Kaplan and Cooper, 1992). In SMEs, ABC can become a valuable management control tool with a positive impact on organizational performance (Needy *et al.*, 2003).

Therefore, the implementation of ABC requires more attention in the context of smaller firms (Askarany *et al.*, 2010). ABC was designed to facilitate accurate cost information regarding production, support activities, specific cost objects, with approaches adaptable to businesses (Kaplan and Cooper, 1992) driving operative improvements (Stevenson *et al.*, 1996). The availability of analytical information can support SMEs in managing relationships between costs, customer value, revenues, profitability and their drivers, enhancing client satisfaction (Kocakulah, 2007). Understanding cost behaviour, SMEs managers can improve decision-making handling the complexities of a globalized context (Foroughi *et al.*, 2017). ABC studies for SMEs highlighted the risks of barriers to its implementation. In these organizations with less than 50 or less than 250 employees, presented as “small” or

“medium” (UE Recommendation, 361/2003), the low diffusion of advanced costing systems was explained by lower operative and structural complexity, financial and human capital constraints, scarce presence of accounting information which can result inaccurate, and by simple management control approaches (Hicks, 1999; Kocakulah *et al.*, 2017). SMEs are based on governance systems where the owner tends to centralize power, with a lack of a clear definition of tasks and responsibilities among employees with a high degree of informality (Barretta, 1999; Sandelin, 2008). These firms usually adopt control processes, rather than formal ones preferring the wider social dimension of personnel and cultural controls, like clan (Maciariello and Kirby, 1994).

The lack of perceived need in adopting advanced costing systems, as ABC, has led to cases of “cultural gap” in SME managers and resistance phenomena in understanding the benefits of using a costing approach as ABC (Rìos-Manriques *et al.*, 2014). SMEs’ distinctive futures and low complexity make the adoption of the “classical” version of ABC an excessive “organizational effort” risking not considering the benefits that can be achieved (Machado, 2012). Thus, it is necessary to find cost allocation systems balancing the cost of errors and measurement with the levels of simplicity required adjusting to the features of SMEs (Needy *et al.*, 2003).

Some ABC models for SMEs have been proposed based on a smooth implementation to overcome resistance, even cultural (Stapleton *et al.*, 2004). Studies suggested “simplifications” of ABC since in an environment where there usually is a low product diversity or a unique production schedule, different cost measurement needs emerge (Vercio and Shoemaker, 2007). Others, based on IT potentialities which become economically accessible for SMEs suggest a low-weight ABC (Attewell, 1992), connecting processes, cost tables and cost estimates using effectiveness systems of “expense-activity-dependence” matrix (Roztocki *et al.*, 2004) or multiple-non-commercial tools (Finke and Bušinska, 2011). Studies showed how a deeper understanding of organizational behavioral dimensions in SMEs could represent a driver to favour simplified ABC approaches (Gunasekaran *et al.*, 1999).

Bharara and Lee (1996) propose a model where, instead of simplifying the structure of ABC, it simplifies its introduction focusing on a collaborative approach by interviewing employees in their daily tasks, organizational structure, and operations. Based on high information sharing and using cost data, it is possible to overcome cases or reluctance in devoting time to track activities performed. This involvement, applicable to SMEs, for a lower number of employees and small-medium scale of operations, allows implementing and maintaining a similar ABC approach in an inexpensive way. Moving from these advantages based on behavioural dimensions as Bharara and Lee (1996), we propose and apply a conceptual model for a “simplified” ABC implementation for SMEs exploiting some of the distinctive futures existing in these small contexts.

2.2 A Collaborative Culture to Unlock ABC Potential for SMEs

In suggesting a simplified ABC model for SMEs, we refer to aspects of organisational culture, as trust and strong employee relationships, informal control processes and simple internal communications, lack of bureaucracy within the working environment. These dimensions, identifying a collaborative culture, have been considered as specific SMEs characteristics, that can facilitate ABC implementation (Gunasekaran *et al.*, 1999; Kocakulah *et al.*, 2017). Literature defines culture as a set of values, beliefs and assumptions shared by members of the same organization, influenced by their activities and observable in their behaviours (Schein, 1991). Organizational culture includes the firm's ability to acquiring and sharing the existing knowledge work, whose effectiveness varies among organisations and measurement systems (Ragab and Arisha, 2013).

Employees' knowledge and expertise of working tasks that make efficient and effective the design and the execution of each activity even in the ABC approach are not an isolated object since these aspects are embedded in people. Even if a careful design of ABC can enhance the effectiveness in the costing system, it becomes unsuccessful if there is a lack of willingness in sharing information among organisational members. Studies in the knowledge work framework argued that a culture of trust and collaboration improves knowledge sharing and organisational effectiveness (Sveiby and Simons, 2002). However, since these cultural aspects are SMEs' characteristics, we believe that these would facilitate ABC implementation. The real issue becomes that of measuring collaboration in SMEs. With this aim, in our ABC approach, assuming a contingency perspective, we consider it as an antecedent variable influencing the willingness of employees to share their knowledge on their working tasks from the definition of the activities. We took as a reference Sveiby and Simons (2002) considering the influence that a "collaborative climate" has on knowledge sharing.

Therefore, in a specific business context higher the level of collaborative, higher is the contribution of shared knowledge offered to organizational members and thus, the support for an effective ABC implementation. We view collaboration as a driver of success in designing a "simplified" ABC to compensate for the technical and procedural simplifications useful to SMEs, with a suitable level of accuracy in line with their informational flexibility. Meiryani (2014) shows that the involvement of users in costing system development is a factor that influences the success of its implementation and should be encouraged in ABC approaches (Raucci and Lepore, 2015; Hooze and Ngo, 2017). When collecting data to design costing systems, SMEs can benefit from open communication coming from a collaborative climate and not formalized processes of management control (Pusic *et al.*, 1998). To overcome the limits of the "classical" ABC in SMEs, our conceptual model is based on the second step of technical integration, which starts from the model of Roztocki *et al.* (2004). This model with "simplified" matrixes "Expense-Activity-Dependence" (EAD) and "Activity-Product-Dependence" (APD) includes

estimations based on an educated guess or systematic appraisal (via an analytic hierarchical process) collecting data in a short time and low cost to allocate overhead cost to products, reaching the accuracy desired. Based on the fruitful integration of the collaborative climate and of the smooth procedure, we present an application of our conceptual model for a gradual and “simplified” implementation of ABC in SMEs. We apply such a model in the transport sector, where factors, such as congestion, decarbonization and digital transition, are expected to increase demand for transport in the EU especially for SMEs who will play an ever-increasing role in meeting this demand (EPRS, 2016).

The European transport sector must have the capacity to deliver the best products and services, in a timely and cost-effective manner. The role of SMEs in meeting these challenges is critical in the role of key players in supply chains (EC, 2017). Nevertheless, SMEs still use traditional methods ignoring advanced ones, as ABC (Ahmand, 2017). Transport companies, mainly SMEs, are rarely focused on cost calculation even if improved costing models can be valuable for their competitiveness. Advanced systems can allow considering operational characteristics of different transport services, improving decision-making and profitability. To overcome this gap, the case study presents the application of ABC in a small road company located in Italy, where SMEs represent 99.9% of firms and the road transport is a leading sector among the first six EU countries with Germany, Spain, Poland, UK, and France (ANFIA 2017).

3. Methodology

The research is based on a case study following Yin (2013). ABC design and implementation in the Small Road company took place from September 2017 till April 2018. The model was designed involving managers and employees. Firstly, we captured insights into the collaborative climate existing in the SME with interviews and direct observation. We considered the scale of Sveiby and Simons (2002) for interviewing managers and employees on dimensions that identify a “collaborative climate”, referring to organizational culture, immediate supervisor, employee attitude and workgroup support. These dimensions identify the SMEs’ characteristics that can facilitate ABC implementation (Kocakulah *et al.*, 2017). An interview of 30 minutes was set with the two managers asking their expectations behind the adoption of an ABC system in line with Bharara and Lee (1996). Further face-to-face interviews of 15 minutes were set with the administrative and maintenance unit. Instead, 15 minutes telephone interviews were carried out from a sample of 30 of the drivers, identified by the managers and administrative office.

After, a first meeting was set involving managers and administrative employees to identify direct and indirect costs. Starting from macro activities, the specific ones have been recognised with their activity cost driver, and three key routes were selected, while a residual one set as “other routes” (n.4). Once that the cost objects were defined, a new meeting was scheduled involving employees from the

maintenance unit and drivers of those routes to explain the need for ABC and in involving them in its design. Contrarily from “classical” ABC, the “Expense-Activity-Dependence” (EAD) as suggested by Roztockichi *et al.* (2004) was designed applying the educated guess technique, already suggested when data is not available (Themido *et al.* 2000) while noticing the collaborative context during the sessions. Next, indirect costs were allocated to the routes through activity-cost drivers and then based on the revenues of the routes, the profits were calculated.

3.1 The Case Study

The Small Road company selected is in the centre of Italy and offers transport services for both national and international companies. Its activities involve transport, national and international shipping, storage of goods and all related logistics activities. Currently, the company has 80 road tractors, 50 trucks, 80 trailers, and 150 semi-trailers. The company with two company managers is organized around three main departments: (1) Administrative office with 15 employees involved in accounting and administrative activities; (2) Transportation with 110 drivers; (3) Maintenance unit with 10 mechanics and 5 lift-truck operators.

3.2 Designing ABC in the SME Road Company

The development of the simplified model was based on data from the balance sheet complemented with meetings with the two managers, employees for the administrative and maintenance area and selected drivers. Firstly, the routes of interest were identified selecting three main ones for the analysis, whereas a fourth one was set to collect costs of all the other residual ones indicated as “other routes”, indicated as *Route 4*. The first three routes are the principal ones offered to clients with the most homogeneous costs. The “other routes” includes minor routes of a different kind, not continuously offered and in most cases on-demand:

Route 1: SULMONA – COMO / MILANO – SULMONA; 300 times per year (beverage transport);

Route 2: ORICOLA - NOGARA (VR) / NOGARA – ORICOLA; 200 times per year (beverage transport);

Route 3: CORFINIO – VERONA (transport of drywall / VERONA - ROMA (milk transport); trip 180 times per year.

Based on accounting data, direct and indirect costs were identified (Table 1).

Table 1. *Direct and Indirect costs (€)*

<i>Direct costs</i>	1	2	3	4	Total
Gross wages	106.463,00	64.452,32	58.489,02	3.027.044,66	3.256.449,00
Tools	71.190,00	36.760,00	39.636,00	1.031.295,93	1.178.881,93
Fuel	163.800,00	82.340,00	75.240,00	3.772.576,86	4.093.956,86
Total	341.453,00	183.552,32	173.365,02	7.830.917,45	8.529.287,79
<i>Indirect costs</i>					
Insurance					409.749,87
Depreciation					206.417,00
Revision vehicles					34.657,44
Lubricants					70.971,38
Maintenance					942.755,86
Damages Expenses					68.504,94
Stationery and software					18.889,29
Telephone and operator					42.862,77
Total					1.794.808,55

The team mapped the “macro” activities as shipment preparation, loading operation, transport, unloading operation and invoicing recognizing the specific ones with their activity cost driver. Then the matrix EAD was designed relating activities and costs, including checkmarks for the costs involved in the activity of the column. These marks were then substituted with a percentage representing the amount of resources used by the activity, through an educated guess. To translate the coefficient in monetary terms, the formula employed by Roztcki *et al.* (2014) was used (Table 2). The coefficient formula is given in equation (1):

$$TCA(i) = \sum^M Expense(j) \times EAD(i,j) \tag{1}$$

Table 2. *Matrix EAD (€/1.000)*

Indirect Costs	Gross Wages	Insurance	Deprec.	Revision	Lubricant	Maintenance	complaints	Stationary software	Phone operator	Total
Orders received	0,135							0,07	1,29	1,495
Elaboration order	0,135							0,11	0,21	0,455
Shipment order	0,081	16,39		0,35		9,43		0,13	1,29	27,67
Recording goods	0,054							0,06	0,21	0,324

Planning transport	0,135	24,58		0,35		9,43		0,47	0,43	35,39
Loading	0,135		5,16	0,69	1,06	18,85	0,68			26,57
Transport	1,62		10,32	1,38	4,97	37,71	2,74			58,74
Uploading	0,135		5,16	0,69	1,06	18,85	0,68			26,57
Complains and returns	0,054						2,74	0,28	0,43	3,50
Duties	0,081							0,38	0,21	0,67
Payment invoices	0,135							0,38	0,21	0,72

After determining the activity drivers (Table 3), the total indirect activity-based costs per route (Table 4) and the unitary profits were calculated (Table 5).

Table 3. *Activiy drivers*

Activity	Activity Driver (AD)	Ruote 1	Ruote 2	Ruote 3	Ruote 4	Total AD
Orders received	N.contact by client	350	220	200	12100	12.870
Elaboration order	Length transaction	0,33h*300 =99	0,33h*200 =66	0,33h*180 =59,4	0,33h*12060 =3979,8	4.204,2
Shipment order	N.shipments	300	200	180	12060	12.740
Recording goods	N.documents	400	300	280	12150	13.130
Planning transport	N.working orders	300	200	180	12060	12.740
Loading	Hours loading	4,16h*300 =1248	4,16h*200 =832	5,5h*180 =990	4,83h*12060 =58249,8	61.319,8
Transport	Distance	393.600	208.800	191.520	12.060.000	12.853.920
Uploading	Hours uploading	4,66h*300 =1398	3,66h*200 =732	4,99h*180 =898,2	4,44h*12060 =53546,4	56.574,6
Complains and returns	N.complaints	15	10	13	60	98
Duties	N.duties received	300	200	180	12060	12.740
Payment invoices	N.payments	12	12	12	600	636

Table 4. Allocation indirect costs (€)

Activity	Indirect Costs (€)	Total AD	Unitary costs AD	Ruote 1	Ruote 2	Ruote 3	Ruote 4	Total Costs
Orders received	14.950	12.870	1,16	406,00	255,20	232,00	14.036,00	14.929,2
Elaboration order	4.550	4.204,2	1,08	106,92	71,28	64,15	4.298,18	4.540,53
Shipment order	276.700	12.740	21,72	6.516,00	4.344,00	3.909,60	261.943,20	276.712,8
Recording goods	3.240	13.130	0,25	100,00	75,00	70,00	3.037,50	3.282,5
Planning transport	353.900	12.740	27,78	8.334,00	5.556,00	5.000,40	335.026,80	353.917,2
Loading	265.700	61.319,8	4,33	5.403,84	3.602,56	4.286,70	252.221,63	265.514,73
Transport	587.400	12.853.920	0,05	19.680,00	10.440,00	9.576,00	603.000,00	642.696
Uploading	265.700	56.574,6	4,70	6.570,60	3.440,40	4.221,50	251.668,08	265.900,58
Complains and returns	35.000	98	357,14	5.357,10	3.571,40	4.642,82	21.428,40	34.999,72
Duties	6.700	12.740	0,52	156,00	104,00	93,60	6.271,20	6.624,8
Payment invoices	7.200	636	11,32	135,84	135,84	135,84	6.792,00	7.199,52
Total				52.766,3	31.595,68	32.232,61	1.759.722,99	1.876.317,58

Table 5. Profits per routes (€)

Routes	Revenues (unitary)	Total costs (directs and indirects <i>actiivity-based</i>)	N.trips (in the year)	Costs (unitary)	Profits (unitary)
1	1.693,00	394.219,30	300	1.314,06	378,94
2	1.230,00	215.148,00	200	1.075,74	154,26
3	1.210,00	205.597,63	180	1.142,21	67,79

4. Discussion

4.1 Exploring the Collaborative Culture of the SME

To gain a preliminary picture of the collaborative culture, an interview was scheduled with the managers. When asked to describe their relationship with employees, both agreed to try to involve most of them in decision-making processes, asking for suggestions, especially when issues occur. This statement related mainly to employees in the administrative area, maintenance unit and drivers of the leading company routes. Both recognized that improvements could be made organizing more regular meetings. Then, after explaining the ABC functions, the managers

confirmed to be willing to adopt it to achieve data to improve the activities of the company and facilitate the control over costs. On the other hand, the administrative employees underlined their involvement in decision making and felt to contribute to the definition of the company's policies. They stated to collaborate with most drivers, especially those of the leading routes and with the unit of maintenance.

To the same extent, employees from the maintenance unit asserted that the two managers ask information and suggestions on how to improve the company's performance organizing meetings to which selected drivers participate together with the administrative area. Instead, drivers from the leading routes, expressed that they felt distant from decision-making processes in the company and some stated not to meet so often the two managers. Even if, they participated in occasional meetings to provide information about the routes when problems and changes occurred. Whereas, they stated to be in touch with employees of the maintenance units, administrative area and drivers of the same route. Drivers on-demand revealed to feel even more unaware of the company's decision-making processes, while closely in touch with selected drivers operating in their same routes.

4.2 Information Potential for SME in the Transport Sector

The initial attempt to design the simplified ABC approach has provided insights for the small road company enhancing its interests towards the costing system. The company did not use any costing system before and did not consider the possibility of implementing an advanced costing system. The climate of the SMEs resulted collaborative with exceptions from drivers based on their route. Knowledge sharing among employees was confirmed during the model design. Different activities were considered for EAD Matrix, from order received, planning transport to payment invoices. Appropriate activity (cost) drivers were selected as presented in Tables (3 and 4). Some concerns were raised by drivers in establishing time drivers for the length of the transaction and the hours of loading and unloading. The administrative employees stated that the SME had never considered monitoring these aspects since they didn't recognize their direct impact on the cost structure of the company. The greatest revelation was to find that the leading routes represented just a small portion (6%) of the total costs. Considering the costs of activities made the company members aware of which were the costly ones and how they distributed themselves among the leading routes. The staff was not surprised in discovering that the profitable route among the three leading ones was n.1 being the most frequent one. Major concerns were raised on the third route for the large amount of indirect costs respect to the revenues. Discussion about client management raised suggestions about defining the length of transaction for the activity of elaborating the order for the routes, set equally as 0.33 h. Such a result made the company aware of the need to consider different policies in managing orders from clients, as in the case of new and old clients.

These issues were part of the final discussion when considering the profits gained from route n.3 respect to the other two leading routes. This was related to the impact of loading and unloading activities. Drivers on the route n.3 revealed that there were persistent time management problems with selected customers, starting from the arrival of drivers, leading to time gaps between load and upload operating. The discussion made the managers aware of the need to involve drivers in decision-making to gain information on these issues and to define different policies for customers. An interesting inquiry was raised by an administrative employee concerning to the way some activity driver was measured. The employee considered complaints and return, asking for the future to measure the time needed to manage each complaint. The same employees raised a discussion about using the number of orders both for the shipment order and planning transport, outlining the possibility of employing time drivers to have a complete picture of how planning transport is managed among the routes.

Overall, the informal conditions in the SME confirmed a knowledge sharing culture that allowed to establish a beneficial discussion in all stages of the design. Managers, administrative employees, and drivers were involved in the process and showed a willingness to contribute. From the final meeting, the managers considered the outcomes useful for understanding the company's activities and gain information from the allocation of costs expressing the intention to further exploit the model. Through ABC, it became possible to understand the origin of costs in terms of complains and returns, unloading and loading operation. Moreover, considering the impact of the fourth route to the cost structure of the company, the managers are considering breaking down the route 4, categorizing some of the most frequent routes on-demand respect to the others. Therefore, administrative employees started to suggest ways to investigate more in deep route n.4 considering some common characteristics, minimizing the residual part of costs in a new route n.5.

5. Conclusions

The study introduced a conceptual model for a simplified and gradual implementation of a simplified ABC approach in a SME in the transport sector, where demand is expected to increase due to digital transition (EPRS, 2016). The climate was captured through interviews and direct observation, designing the model with managers and staff. The gradual introduction of the model proved to be beneficial in raising the attention of the company on the possibility of introducing advanced costing systems exploiting knowledge sharing among peers and with superior. By presenting a gradual implementation of the model we agree with Turney's (1991) observation according to who it is necessary to demonstrate the benefits achievable from the use of ABC to be able to generate interest in its adoption. We further confirm the vision of Beng *et al.* (1994), stressing the need to better educate managers and entrepreneurs, so that adoption of the concept will become more widespread. The SME, after understanding the impact that activities have on the cost structure, is considering adopting ABC not only to keep control of

the cost of its activities but mainly to improve its operative mechanisms, as in managing different customers.

The model we propose starts from the premise that the collaborative climate is an antecedent for its successful implementation. Nevertheless, the research has some limitations. First, more accurate measurement and analysis of a collaborative climate are required since results are based only on a qualitative approach. Second, the research is based on a single case, therefore results cannot be generalized. Therefore, further cases are required to give validity to the overall model also respect to different sectors and countries. Further aspects to consider are related to the adoption of new technologies in SMEs and how these can affect sharing knowledge within the organisation.

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